

Amendments to the Claims:

This listing of claims will replace all prior version, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method for debugging a distributed software system that includes first and second components and a coordinator that implements a desired interaction between the first and second components; ~~each component~~ components, the components and the ~~said~~ coordinator including coordination interfaces that expose events, and the ~~debugging~~ method comprising ~~the steps of:~~
 creating ~~an event record~~ event records in response to ~~each exposed event~~
 that ~~occurs~~ exposed events that occur during an execution of the distributed software system, each event record including identification of a component that generated the event and a local time stamp;
 accumulating the event records into an event database; and ~~then~~
 displaying an evolution diagram for use by a developer in debugging the distributed software system, the evolution diagram including a graphical representation of at least a selected portion of the event database.
2. (currently amended) A method according to claim 1 wherein said displaying ~~step~~ includes operation comprises displaying at least a first selected event together with the identification of the component that generated the selected event.

3. (currently amended) A method according to claim 1 wherein the displaying step includes operation comprises presenting in the evolution diagram:

a first graphical display element representing a first component of the software system; and

a second graphical display element representing a first selected event generated by the first component;

the first and second graphical display elements being juxtaposed so as to visually indicate that the first selected event was generated by the first component.

4. (currently amended) A method according to claim 1 wherein the displaying step includes operation comprises presenting in the evolution diagram:

a first graphical display element representing a first event;

a second graphical display element representing a second event; and

a third graphical display element indicating a causal relationship between the first and second events.

5. (currently amended) A method according to claim 4 wherein each at least one of the first and second graphical display elements comprises an identifier of a component that generated the corresponding event.

6. (original) A method according to claim 4 wherein the causal relationship comprises sending a message as the first event and receiving the said message as the second event.

7. (currently amended) A method according to ~~claim 6~~ claim 4, wherein the third graphical display element comprises an arrow extending from the first graphical display element to the second graphical display element.

8. (currently amended) A method according to claim 4 wherein at least one of the first and second events ~~consists of~~ involves a control state change exposed at the coordination interface of one of the components.

9. (currently amended) A method according to claim 4 wherein at least one of the first and second events ~~consists of~~ involves a message sent from a port at the coordination interface of one of the components.

10. (currently amended) A visual display for use by a developer in debugging a distributed or concurrent software system, the visual display ~~comprising~~ comprising:

an evolution diagram responsive to a ~~predetermined~~ set of event records generated during an execution of the subject software ~~system~~; system, each event record reflecting a corresponding software system ~~event~~; event;

wherein the evolution diagram comprises:

a first graphical display element representing a component of the software system; and

a second graphical display element representing an event generated by the component;

the first and second graphical display elements being juxtaposed in the visual display so as to cue the developer that the event was generated by the component.

11. (original) A visual display according to claim 10 wherein each of the event records is responsive to one of a timer tick, a data departure, a data arrival or a mode change.

12. (canceled)

13. (currently amended) A visual display according to ~~claim 12 wherein~~ claim 10, wherein:

the first graphical display element ~~representing a first component of the software system~~ comprises a generally horizontal ~~bar~~ bar; and

the second graphical display element comprises a generally vertical icon overlapping the generally horizontal bar.

14. (currently amended) A visual display according to claim 10 wherein the evolution diagram ~~includes~~ further comprises:

~~a first graphical display element representing a first component of the software system;~~

~~a second graphical display element representing a second component of the software system; and~~

a third graphical display element representing an implicit message from the first component to ~~the~~ a second component.

15. (currently amended) A visual display according to claim 10 wherein the evolution diagram ~~includes~~ further comprises:

~~a first graphical display element representing a first component of the software system;~~

~~a second graphical display element representing a second component of the software system; and~~

a third graphical display element representing an explicit message from the first component to ~~the~~ a second component.

16. (currently amended) A visual display according to claim 10 wherein the event comprises a first event and the evolution diagram ~~includes~~ further comprises:

~~a first graphical display element representing a first event;~~

a second third graphical display element representing a second event; and

a ~~third~~ fourth graphical display element representing a causal relationship between the first and second events.

17. (currently amended) A visual display according to claim 16 ~~wherein~~ wherein:
the first graphical display element includes identification of ~~[[a]]~~ the
component that generated the ~~said~~ first event;

the first event is comprises sending a message;

the second event is comprises receipt of a message caused by the first
event; and

the ~~third~~ fourth graphical display element comprises an arrow having a tail
positioned adjacent the first second graphical display element and a head
positioned adjacent the ~~second~~ third graphical display element.

18. (currently amended) A visual display according to ~~claim 12~~ claim 10, wherein
the first graphical display element includes indicia identifying a control state of the
first component and indicating its current value.

19. (currently amended) A visual display according to ~~claim 12~~ claim 10, wherein
the first graphical display element includes indicia identifying an exported variable of
the first component and indicating its current value.

20. (currently amended) A method according to claim 4, wherein the ~~for debugging~~
~~a distributed, hierarchical software system that includes a plurality of design levels,~~
~~each design level comprising two or more components and a coordinator that~~
~~implements desired interaction between the~~ components, ~~said components; each~~
~~component and the coordinators with which it interacts including respective~~
~~complementary coordination interfaces that expose events, and the debugging~~
method further ~~comprising the steps of:~~

~~creating an event record in response to each exposed event that occurs~~
~~during an execution of the distributed software system, each event record including~~
~~identification of a component that generated the event and a local time stamp;~~

~~accumulating the event records into an event database;~~

at least ~~partially~~ ordering the event database based on the time stamps; and
then

~~displaying an evolution diagram for use by a developer in debugging the distributed software system, the evolution diagram including a graphical representation of at least a selected portion of the event database.~~

21. (currently amended) A method according to claim 20 wherein said displaying ~~step includes~~ operation comprises selecting one of the design levels and displaying an evolution diagram corresponding to the selected design level including graphical indicia including events exposed at the coordination interfaces of components defined at the selected design level, thereby hiding subsystem interactions from view.

22. (original) A method according to claim 21 and further comprising selecting a temporal subset of the event database for inclusion in the displayed evolution diagram thereby selectively focusing on a region of interest to the developer.

23. (currently amended) A method according to ~~claim 20~~ claim 1, wherein the execution is simulated.

24. (currently amended) A method according to ~~claim 20~~ claim 1, wherein the execution is carried out on a target hardware platform.

25. (currently amended) A method according to ~~claim 20~~ claim 1, wherein the software system is instrumented so as to generate event records at selected points in execution that are not events exposed at the coordination interface of a component.

26. (currently amended) A method according to ~~claim 20~~ claim 1, wherein the execution is carried out on a distributed, embedded target hardware platform comprising a plurality of hardware subsystems, and the event records are collected from ~~each~~ two or more of the hardware ~~subsystem~~ subsystems.

27. (original) A method according to claim 20 wherein said displaying the evolution diagram includes combining a selected sequence of events on a single component so as to form an event cluster, and then displaying the event cluster.

28. (original) A method according to claim 20 wherein said displaying the evolution diagram includes combining a selected group of components so as to form a component cluster, and then displaying a single trace representing the component cluster.

29. (original) A method according to claim 20 wherein said displaying the evolution diagram includes combining a selected group of state traces so as to form a state cluster, and then displaying a single trace representing the state cluster.

30. (original) A method according to claim 20 and further comprising filtering selected events, states or components from the evolution diagram.